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This study analyzes interstate redistribution of Federal tax money under Title One of the Elementary and Secondary Education Act of 1965. First, the consistency of the criteria used to distribute funds is studied to see if people of similar financial positions are treated "qually. Results show that when compared with an alternative--the Orshansky index--the present official need index provides a satisfactory measure of the disadvantaged school population. The second part of the analysis looks at how people in different financial positions are treated. Consideration of both net transfers and gross aid leads to the conclusion that the degree of redistribution under the present program is very small. This suggests that the first major act of Federal aid to education is conservative when judged by distributional standards. If future Federal aid legislation is to make a marked contribution to the equalization of States' ability to provide education, fiscal capacity must be introduced as a criterion for distributing Federal funds. (TT)

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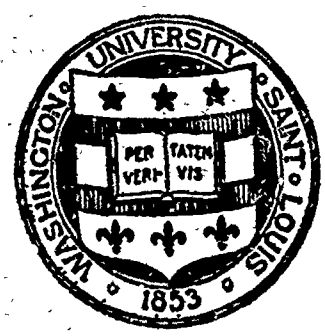

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The passage of the Elementary and Secondary Education Act (ESEA) of 1965 has been widely regarded as a turning point in intergovernmental relations. Together with amendments passed in 1966 and 1967, the ESEA of 1965 gave the Federal Government for the first time a comprehensive role in the financing of education. Constitutional and political obstacles which previously blocked acceptance of such a role have apparently been surmounted.

As a new program of federal grants-in-aid involving the distribution of large amounts of federal tax money, the ESEA has considerable interest for the student of intergovernmental relations. Like all such programs, it leads to spatial redistribution of funds among states and within states. The formula governing this redistribution deserves analysis simply because of the quantitative importance of the program. However, the formula may well have significance beyond the particular program in which it is now embodied. Given the widespread support which the ESEA has received, it seems likely that federal aid to education will expand further in the future. Because it is based on an acceptable political compromise, the ESEA's formula may be used as a model by politicians fashioning new federal grant programs to aid education in the years to come.

Evaluating Federal Grant Programs

1. Functional versus Distributional Grants

Theoretically, grants have been treated in two different ways. One group of students sees grants as tools to improve allocation in a

federal state. In models of this kind, the need for grants arises because governmental functions cannot be mapped perfectly into the existing governmental set-up. Imperfect mapping leads to spill-outs and spill-ins among communities. Because benefits cannot be captured completely by the community providing the service, non-optimal allocation results. Functional grants designed to counteract the effects of spill-outs will lead to more efficient allocation.[1]

The functional approach may be contrasted with the distributional one. Students adopting this point of view look on grants as cost sharing plans or programs designed to redistribute public revenues among the member states of the federation. The analysis starts from the assumption that federal structure is important and that the federal government should deal with member states rather than individuals in the policy area where the grant applies. Unlike functional grants, programs with a distributional intent have the objective of diminishing inequality among the members of the union.[2]

Education is a service with important external benefits and a case for purely functional grants-in-aid to education could well be

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[1]See for example Albert Breton,"A Theory of Government Grants," The Canadian Journal of Economics and Political Science, 31. (May 1965) pp. 175-187.

[2]The distributional approach is best represented by Richard Musgrave's article "Approaches to Fiscal Theory of Political Federalism," Public Finances: Needs, Sources, and Utilization. National Bureau of Economic Research. Special Conference Series (Princeton, N. J.: Princeton University Press, 1961).

made.[3] However, a lack of knowledge about the exact nature of spillovers and a lack of statistical data preclude the construction of functional grant formulas. While we can identify education as an appropriate policy area, the theory of functional grants does not seem to provide any guide to the actual distribution of federal funds.

It is perhaps best to see existing programs of federal aid to education as a compromise between the two approaches. Congress chooses a particular service such as education because the existence of externalities provides a basis for federal intervention. Thus, the program is partially designed to increase the total amount of money devoted to education. At the same time, the program which is fashioned has distributional intent; it is conceived as a cost sharing plan which redistributes the burden of providing a given type of service. This interpretation seems certainly appropriate for the ESEA. In this case, Congress decided that the education of the disadvantaged was a problem of national importance. It then authorized intergovernmental grants in order to readjust the burden of financing programs of special education for children from poor families. The redistributive character of the grant is clear from the fact that federal aid to education is seen as an important means for helping to mitigate the fiscal problems of state and

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[3]See Burton A. Weisbrod, External Benefits of Public Education (Princeton, N. J.: Industrial Relations Section, Princeton University, 1964) and Werner Z. Hirsch et al., Spillover of Public Education Costs and Benefits (Los Angeles: Institute of Government and Public Affairs, University of California, 1964).

local governments while using the federal tax mechanism as a tool to channel resources from rich to poor states.

Federal funds distributed under the ESEA fall into two categories of unequal importance. Title One, which we analyse in this paper, authorizes much larger expenditures than any of the other provisions and money is allocated in accordance with a simple flat grant formula. Authorizations under Title One have been growing dramatically since the legislation was first enacted in 1965, with about one billion dollars available for distribution in each of the first three years. Other titles provide much smaller amounts of aid for such specialized objectives as the strengthening of state education departments, the expansion of school libraries and the support of educational research. We leave these more specialized and less important incentive payments aside to concentrate on the more basic and more general grants of Title One where the intent is redistributive.

2. Criteria for Analyzing Distributive Grants

The economist analyzing a given tax or tax system faces problems which are similar to those arising from redistributive grants. While he cannot in his role as economist make statements on the desirability of redistributing income among taxpayers, he may nevertheless appraise the tax system with regard to its ability to achieve stated or implied goals. Economists find it useful to distinguish between two different kinds of distributional considerations. A program is considered horizontally equitable when people who have the same resources and financial position

are treated in the same manner; this is commonly referred to as equal treatment of equals. The second consideration--vertical equity--refers to the way in which people in different positions are treated.

The economist can serve a useful purpose by examining various indices of equality and by checking whether equals, once defined, are in fact accorded equal treatment (horizontal equity). He may also point out the progressive or regressive impact of a given tax policy although he cannot make professional judgements about the desirable degree of vertical equity.

A similar approach may be taken in evaluating grants. It is most convenient, perhaps, to divide the analysis into two steps. Grants are paid out to the states according to a given set of criteria. Redistribution among states depends then in part on these criteria and an analysis of their horizontal consistency is indicated. It depends, in addition, on the way in which the federal government raises the funds to be given away in grants. As a second step, the analysis must proceed therefore to the discussion of the federal tax system. Only by considering both sides can we determine the program's net impact on the states.

Criteria of Distribution

1. The Measurement of Need

A special purpose grant with distributional intent is a plan for sharing the burden of providing a given program or service among the members of the federation. Federal payments must be in accordance with the number

of people served by the program and the unit cost of providing the service; that is, to use a term common in the literature, the payments must be in accordance with need. As a result, the formula governing the distribution of funds by the federal government should include a way of measuring both the number of people served by the program and an adjustment factor proportional to program cost.

As mentioned, the ESEA is intended to help school districts in upgrading the education of "educationally deprived" children. The special purpose of the program is clear from both the language of the 1965 Act and from the congressional hearings which preceded it. The meaning of the term "educationally deprived" is spelled out in a memorandum drawn up by the Office of Education at the request of the Senate Subcommittee on Education:

> An educationally deprived child is one whose educational performance in the school system is below the grade level appropriate for his age and below the potential of the child because of his general social and economic background. The educationally deprived child may perform at a rate which is normal for his economic and social group but he does not perform at a normal rate on a systemwide, statewide, or nationwide basis.[4]

In order to make this definition operational so that it can be used as a basis for the distribution of funds, a way of statistically identifying educationally deprived children must be found. In the legislation, this problem has been solved in the following manner: The number of children falling under the Act's definition is said to consist of

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[4]U. S. Senate, Committee on Labor and Public Welfare, Hearings on the Elementary and Secondary Education Act of 1965. (Washington: Government Printing Office, 1965), Vol. I, p. 565.

(1) the number of children aged 5-17, inclusive of families receiving an annual income below $2,000.

(2) the number of children of such ages from families receiving an annual income in excess of the low-income factor from payments under the program of aid to families with dependent children under a State Plan approved under Title IV of the Social Security Act.[5]

Title One uses the total of such children as the basic measure of need in the allocation of funds. However, distribution takes place according to the weighted number of qualified children, not simply in accordance with the size of the disadvantaged school population. The weights used in the basic formula consist of average expenditure per pupil in the recipeint state. As shall be seen, the introduction of weights affects distribution in a substantial fashion.

2. The Index of Need

How appropriate is the index of need, given the program's purpose? As pointed out, horizontal equity requires a measure of need which is proportional to program costs as they exist in the states. In dealing with this question we shall proceed in two steps, looking first at the way in which the number of children who qualify is determined and turning secondly to the weighting procedure which is part of the formula.

A. Measuring the Educationally Deprived School Population

The obstacles which must be surmounted if we attempt to arrive at an accurate statistical measure of the educationally deprived school

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[5]These provisions were amended in subsequent years to include other children within the care of state agencies and to adjust the low income figure to $3,000.

population are considerable. The memorandum which was quoted defines deprivation in terms of poor achievement. The educationally deprived child performs below the rate which is normal on a systemwide, statewide or nation-wide basis. This definition would seem to suggest the use of achievement scores as an index of identification. In practice, achievement scores are not available on a comprehensive basis, however, and a substitute measure must be devised.

Recent studies have shown that low family income and low achievement in school are highly correlated.[6] Low achievers are concentrated nearly in schools located in low-income areas, a finding which was much stressed in the hearings preceding the enactment of the 1965 legislation. In fact, it was widely assumed that underachievement is a direct result of poverty. While the linking of poverty and low achievement appears justified, several points should be noted.

(1) The studies link average achievement scores to average family income (median), the averages being either for school attendance areas or districts. The relation does not seem to have been investigated on a large scale for individual pupils.

(2) The studies have been done almost exclusively in urban areas. It is not known whether income is as important a factor in explaining low achievement for rural pupils as it is for urban pupils.

(3) It is not known how the degree of retardation is related to income.

Once we substitute the term "children from poverty families" for "educationally deprived children," we face a new problem of identification.

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[6]For a discussion of this relation and its implications for existing equalization grants, see Walter Hettich, "Equalization Grants, Minimum Standards, and Unit Cost Differences in Education," Yale Economic Essays, forthcoming.

What is a poverty family? In most governmental programs the answer to this question has been: a family which falls below a defined subsistence level of income. It should be clear that such a level must be measured in real terms since it represents an actual minimum budget for food and shelter. A simple dollar cut-off figure could hardly give us an index for identifying children suffering from educational deprivation. The cut-off line must be adjusted for factors such as family size and rural versus non-rural residence. An accurate definition is important for achieving horizontal equity. A poverty line which fails to distinguish between rural and non-rural residence, for example, will favor the rural over the more urbanized states because of the lower cost of living in rural areas.

The poverty line used in the ESEA is not designed as a real line, since it is a monetary income measure constant for all people and all states. The only exceptions made are for children from families receiving money under the Aid for Dependent Children section of the Social Security Act and children in other categories mentioned above. It is important, therefore, to ask how far the present index deviates from one which is based on a consistent and systematic definition of poverty. Table 1 provides an answer to this question. It shows both components of the actual index (number of children from families having less than $2000 of income in 1960 and number of children who qualify because they are enrolled under the AFDC program). The total of Title One children is then contrasted with the number of children classified as poor on the basis of an index

TABLE 1

Numbers of Children Eligible for Assistance Under ESEA
Alternative Definitions - FY 1966

Children from Families with Income Less Than $2000

50 States and D.C.	Low Income	AFDC	Total	% of Whole	Orshansky Poor Number	%
Alabama	242522	0	242522	4.4	440967	4.0
Alaska	4796	919	5715	0.1	11174	0.1
Arizona	38851	5603	44454	0.8	97722	0.9
Arkansas	148158	0	148158	2.7	254827	2.3
California	206572	102097	308669	5.6	543819	5.0
Colorado	33581	7322	40903	0.7	88522	0.8
Connecticut	20731	7595	28326	0.5	56159	0.5
Delaware	7422	0	7422	0.1	19451	0.2
Florida	142533	0	142533	2.6	366639	3.3
Georgia	239789	0	239789	4.3	483898	4.4
Hawaii	8830	2413	11243	0.2	33668	0.3
Idaho	12250	2411	14661	0.3	34311	0.3
Illinois	147518	82499	230017	4.2	363247	3.3
Indiana	76386	3515	79901	1.4	208310	1.9
Iowa	71789	9265	81054	1.5	151858	1.4
Kansas	40263	5449	45712	0.8	101133	0.9
Kentucky	193559	0	193559	3.5	346487	3.2
Louisiana	201090	192	201282	3.6	410150	3.7
Maine	18408	2725	21133	0.4	62149	0.6
Maryland	53716	9420	63136	1.1	153457	1.4
Massachusetts	47065	16817	63882	1.2	145636	1.3
Michigan	124712	21029	145741	2.6	328255	3.0
Minnesota	77280	11602	88882	1.6	177391	1.6
Mississippi	254903	0	254903	4.6	386828	3.5
Missouri	125159	11297	136456	2.5	266527	2.4
Montana	14106	1484	15590	0.3	35879	0.3
Nebraska	34417	672	35089	0.6	79472	0.7
Nevada	3238	675	3913	0.1	8430	0.1

TABLE 1 (Continued)

	Low Income	AFDC	Total	% of Whole	Number	%
New Hampshire	5932	1052	6984	0.1	21404	0.2
New Jersey	59845	25496	85341	1.5	162666	1.5
New Mexico	37554	4315	41869	0.8	93809	0.9
New York	200060	99846	299906	5.4	560255	5.1
North Carolina	323096	3515	326611	5.9	598038	5.5
North Dakota	23346	1775	25121	0.5	52857	0.5
Ohio	151895	25472	177367	3.2	392856	3.6
Oklahoma	84779	11168	95947	1.7	178678	1.6
Oregon	23933	6295	30228	0.5	61509	0.6
Pennsylvania	175394	60258	235652	4.2	495346	4.5
Rhode Island	12083	4007	16090	0.3	33755	0.3
South Carolina	206638	0	206638	3.7	366098	3.3
South Dakota	30712	1528	32240	0.6	58127	0.5
Tennessee	220048	0	220048	4.0	410977	3.7
Texas	398224	0	398224	7.2	892676	8.1
Utah	11680	2109	13789	0.2	37352	0.3
Vermont	7208	580	7788	0.1	24639	0.2
Virginia	167874	3088	170962	3.1	357576	3.3
Washington	33072	9865	42937	0.8	90291	0.8
West Virginia	106406	82	106488	1.9	199943	1.8
Wisconsin	58446	10445	68891	1.2	159633	1.5
Wyoming	5408	661	6069	0.1	14199	0.1
District of Columbia	14854	5900	20754	0.4	45650	0.4

Source: Col. 1 & 2: U. S. Senate, Committee on Labor and Public Welfare, Subcommittee on Education, Maximum Grants - ESEA of 1965, (Washington: Government Printing Office, 1965)

Col. 5: U. S. Bureau of the Census, Special Tabulation

developed by Mollie Orshansky of the Social Security Administration using data from special runs made by the Bureau of the Census.[7] It is most interesting to note that the inclusion of AFDC children in the present legislation brings us close to a poverty index defined in real terms.[8] A comparison of columns 4 and 6 indicates that the proportion of poor children in each state under the present measure closely approximates the proportion which would result if the Orshansky poverty index were used. It is an intriguing question to the analyst whether this result is a coincidence or whether it shows actual legislative wisdom.

B. Index Weights

As pointed out, the distribution of federal funds takes place according to the weighted number of disadvantaged children in each state. Average per pupil expenditure in each state is used as the

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[7]Further information on our use of the Orshansky index and a more detailed comparison between the two measures of poverty may be found in David Barkin, "Poverty and Federal Aid to Education," Economic Development Administration Working Paper 4, Institute of Urban and Regional Studies, Washington University, St. Louis, Missouri, 1967 (processed).

[8]Ten of the states do not participate in the AFDC program and this helps to explain why the addition of eligible children under this program approximates the Orshansky measure. These states are concentrated in the southeastern part of the country and thus reduce the proportionate share of eligible children from these states; the straight money income measure tends to increase the relative number of eligible children in this region. The AFDC adjustment will become increasingly ineffective after 1968 because of a change in the Social Security legislation freezing the number of eligible children participating in the program after January 1, 1968.

weighting factor. In Table 2, we give expenditure per pupil by state both in absolute figures and as a percentage of the national average. Does the inclusion of these weights accord with horizontal equity?

We have defined need as the cost of providing a given service and pointed out that the index of need should be proportional to such cost. We may then ask whether the use of average expenditure is a way of taking into account variations in unit cost among states. If so, the weighting procedure would seem acceptable.

Some reflection on the determinants of per pupil expenditure will make it clear that factors other than cost variations are more important in accounting for differences in average per pupil expenditure. While it is probable that such cost variations do exist, their causes will be manifold and complex and it is unlikely that they can be taken into account in a federal formula without complicating it unduly. Furthermore, it is improbable that the range in the weighting factor from .5 to 1.5 can be fully explained by such differences in cost as may exist.

A second attempt to justify the use of average expenditure figures as weights in the present formula is based on the alleged relation between average expenditure per pupil and fiscal or tax effort for the support of education. It is common to include a variable for tax effort in intergovernmental programs. States or local communities making a large effort on their own, i.e. communities who spend a large share of available

Table 2

State Expenditures Per Pupil 1963-64
(1/2 Current Expenditures)

50 States and D.C.	1/2 Current Expenditures	Percent of National Average
Alabama	143	0.65
Alaska	337	1.53
Arizona	233	1.05
Arkansas	153	0.69
California	253	1.14
Colorado	239	1.08
Connecticut	254	1.15
Delaware	266	1.20
Florida	193	0.87
Georgia	156	0.70
Hawaii	211	0.96
Idaho	174	0.79
Illinois	266	1.20
Indiana	230	1.04
Iowa	230	1.04
Kansas	334	1.06
Kentucky	156	0.70
Louisiana	190	0.86
Maine	190	0.86
Maryland	241	1.09
Massachusetts	259	1.17
Michigan	238	1.08
Minnesota	276	1.25
Mississippi	121	0.55
Missouri	219	0.99
Montana	244	1.10
Nebraska	200	0.91
Nevada	243	1.10
New Hampshire	208	0.94
New Jersey	288	1.30
New Mexico	234	1.06
New York	366	1.65
North Carolina	162	0.73
North Dakota	208	0.94
Ohio	221	1.00
Oklahoma	181	0.82
Oregon	273	1.23
Pennsylvania	237	1.07
Rhode Island	251	1.13
South Carolina	133	0.60
South Dakota	216	0.98
Tennessee	146	0.66
Texas	197	0.89
Utah	209	0.94
Vermont	225	1.02
Virginia	179	0.81
Washington	251	1.14
West Virginia	160	0.72
Wisconsin	262	1.19
Wyoming	257	1.16
District of Columbia	259	1.17

Source: U.S. Senate, Committee on Labor and Public Welfare, Subcommittee on Education, Maximum Basic Grants-ESEA of 1965, (Washington: Government Printing Office, 1965).

resources on the service which the higher level of government considers important, are rewarded with a correspondingly higher federal or state share. Effort provisions are also intended to counteract the substitution effect, by including them, the higher level of government hopes to prevent lower governmental units from reducing their effort in response to the federal or state program. It should be clear that effort provisions are not meant to counteract existing inequalities in resources; rather, they are designed to relate the distribution of funds to the way in which states make use of their given capacity.

Is average expenditure per pupil a good proxy for effort? Students of public finance are in agreement that effort, whether by states or individual tax payers, should be related to some base. In other words, effort is a relative concept, it can best be expressed in percentage terms. A high absolute figure may merely indicate a high base. A state where the average per pupil expenditure is high in relation to the national average may spend a smaller percentage of taxable resources on education than one where average per pupil expenditure is low in absolute terms. If an effort provision is desired, horizontal equity would seem to demand the use of a relative rather than an absolute measure.

3. Fiscal Capacity as a Criterion for Distribution

Before turning to a quantitative analysis of redistribution under the ESEA, it may be useful to discuss a criterion of distribution not included in the Title One formula. The ESEA does not relate the distribution of federal funds to fiscal capacity in the recipient state. The

use of fiscal capacity is common in state grants to local governments and it has been advocated for federal programs by the prestigious Advisory Commission on Intergovernmental Relations. By relating federal payments to fiscal capacity, we can increase the net flow of funds from the wealthier to the poorer states.

Both horizontal and vertical distribution effects need be considered when evaluating the appropriateness of fiscal capacity as a criterion for grant programs. The question of whether to include such a measure is one of vertical equity. That is, the degree of redistribution from rich to poor states will be changed by this factor. The desirability of increased transfers of this sort is best evaluated through the political process. Once fiscal capacity is admitted as a criterion for distribution, then the question of horizontal equity arises. A consistent measure, one that does not differentiate among equals, must be used. The choice is not a simple one, it involves us in the question of how the taxable capacity of a state can best be measured, a question which has been debated at length in the literature on local finance. In our quantitative analysis of different distribution formulas, we use personal income by state while realizing that a case for other measures can be made as well.

Redistribution Under the ESE Act

1. Net Transfer Among States

As pointed out, the actual redistributive effect of a federal program such as the ESEA depends both on the criteria which govern the

allocation of funds among states and on the tax system through which federal revenues are raised. In analyzing interstate redistribution, it is convenient to think of the money which Congress makes available in grants as a fund of given size. Payments into this fund are raised through the federal revenue system. To determine inflows, we look at federal collections in each state. As a second step, we then adjust collection data for interstate shifting.[9] In what follows, we have used a study by Labovitz in which he identifies the geographic origin of federal government revenues as the basis for our estimate of inpayments. Readers are referred to his study for a specification and discussion of the assumptions that underlie the figures.[10]

While payments into the fund depend on the federal revenue system as a whole, outpayments to the states are made according to the specific criteria of distribution established for the grant programs. Inpayments are thus given at the time of enactment, while distributional criteria remain to be fixed in the legislation.[11] In the policy making process,

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[9]This procedure may be considered objectionable because a particular program might be viewed as marginal and should, therefore, be financed by that source of revenue which would be reduced if the scale of governmental operations were to be reduced. This seems impractical in view of the lack of information about the way in which Congress would change the tax structure.

[10]I. M. Labovitz, "Federal Revenues and Expenditures in the Several States," Legislative Reference Service, Library of Congress, Washington, September 19, 1962 (processed). We assume that the geographic origin of federal revenues has not varied since this study.

[11]We assume that enactment of the grant program is not coupled with an increase in taxation.

Table 3

Net Distribution with Present Formula for ESEA
(Fiscal Year 1966)

50 States and D.C.	Tax Payments	Entitlements (Thousands of Dollars)	Net Aid
Alabama	12,245	34,635	22,390
Alaska	1,030	1,927	896
Arizona	7,439	10,360	2,921
Arkansas	6,180	22,600	16,420
California	122,447	77,991	-44,455
Colorado	10,987	9,774	-1,213
Connecticut	23,003	7,197	-15,806
Delaware	5,493	1,975	-3,518
Florida	30,555	27,479	-3,076
Georgia	16,365	37,342	20,977
Hawaii	3,548	2,375	-1,174
Idaho	3,432	2,546	-886
Illinois	77,702	61,113	-16,589
Indiana	27,008	18,378	-8,630
Iowa	14,647	18,653	4,006
Kansas	11,559	10,717	-841
Kentucky	12,474	30,131	17,657
Louisiana	14,991	38,344	23,353
Maine	4,921	4,014	-907
Maryland	21,171	15,249	-5,922
Massachusetts	37,993	16,540	-21,454
Michigan	51,495	34,736	-16,760
Minnesota	19,569	24,509	4,940
Mississippi	6,065	30,894	24,830
Missouri	27,121	29,858	2,737
Montana	4,005	3,801	-204
Nebraska	7,896	7,033	-863
Nevada	2,402	952	-1,450
New Hampshire	3,891	1,452	-2,438
New Jersey	47,378	24,560	-22,818
New Mexico	4,577	9,805	5,228
New York	149,111	109,658	-39,453
North Carolina	17,966	52,826	34,860
North Dakota	2,746	5,220	2,474
Ohio	64,084	39,186	-24,899
Oklahoma	11,215	17,394	6,179
Oregon	11,100	8,246	-2,854
Pennsylvania	76,330	55,941	-20,389
Rhode Island	5,607	4,040	-1,568
South Carolina	8,012	27,479	19,467
South Dakota	2,862	6,953	4,092
Tennessee	14,647	32,206	17,559
Texas	51,725	78,323	26,598
Utah	4,577	2,877	-1,701
Vermont	2,061	1,750	- 311
Virginia	19,913	30,619	10,706
Washington	18,310	10,774	-7,535
West Virginia	8,124	16,991	8,867
Wisconsin	24,260	18,060	-6,200
Wyoming	2,061	1,563	- 498
District of Columbia	8.125	5,382	-2,743

Source:

Column 1: Proportion of tax revenue from each state based on I.M.Labovitz, "Federal Revenues & Expenditures in the Several States," Leg. Ref. Ser., Lib. of Congress, Washington, Sept. 1962.

Column 2: Computed from number of eligible children and one-half current

net redistribution is established therefore when program criteria are determined. The student of grant programs who wants to analyze inter-state redistribution must focus on such criteria. As indicated, it is a major purpose of this article to spell out the implications of the ESEA and to contrast existing arrangements with possible alternatives. In this section we do this by contrasting net redistribution under Title One with patterns of vertical equity which would result if other criteria of distribution were specified. While only a political decision can determine the superiority of one pattern over another, we think it useful to present the menu of choices as clearly as possible.

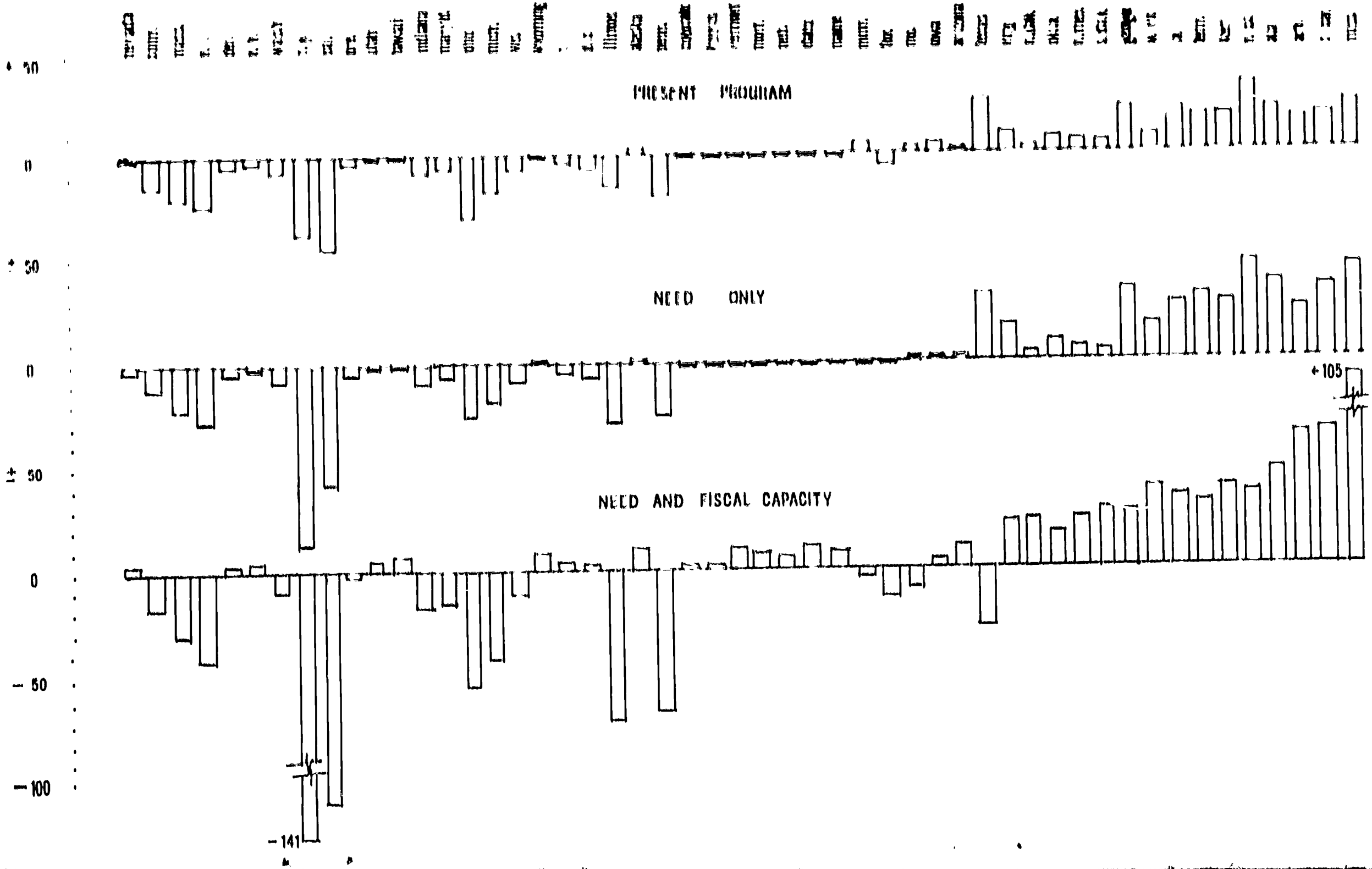
In Table 3 we summarize the actual situation under Title One, giving both state contributions to the total fund and federal out-payments. The figures of outpayments used in this analysis are the states' entitlements based on the assumption that each unit will seek to spend all the money it is eligible to receive under the program. There may be differences between entitlements and actual disbursements for any number of reasons ranging from specific circumstances in an individual school district which inhibit the administrators from making application for the funds to inadequate facilities and/or personnel to undertake a program of compensatory education. Since we are interested in contrasting the implications of the existing formula with the results of alternative formulas, entitlements rather than disbursements are the appropriate variable.

The nature of redistribution can be grasped more clearly from an inspection of Figure 1 where net transfers under the 1965

Figure 1

NET TRANSFERS AMONG STATES WITH ALTERNATIVE CRITERIA OF DISTRIBUTION

(MILLIONS OF DOLLARS)



formula have been depicted graphically. In interpreting the figure, it is important to note that states have been ranked according to fiscal capacity per unit of need. Nevada, having the highest income per eligible child, is placed at the far left while Mississippi, the state with the lowest ratio, is found on the far right. The reason for the ordering is analytical: If we look on the ESEA as a federal cost sharing plan, designed for a special purpose, i.e. the financing of programs for the disadvantaged, we must be interested in the outflow of funds from states with high income per unit of need to states with low income per unit of need.[12] Figure 1 shows that, on the whole, there is a flow in this direction. New York, California and Ohio are the largest net contributors while the Southern States, all placed at the low end, are net gainers. It is interesting to note that a large group of states break nearly even, getting back in grants an amount roughly equal to that which the Federal Government raises from their tax payers for the ESEA fund.[13]

We turn now to a contrast of the actual formula with one which uses only the measure of need - the number of children - and distributes

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[12]It should be recalled in this connection that need is measured by eligible children, not by the population at large. A ranking according to per capita income would not be suitable, therefore.

[13]The analysis in this paper deals only with interstate changes induced by the federal expenditure and taxation process. We recognize the importance of but do not enter into the difference which emerges because rich people in poor states are, on the whole, net taxpayers while their poor neighbors are net recipients of tax funds. This interstate redistribution of income is beyond our scope.

the appropriation according to the share of children in a particular state eligible for assistance. Unlike the existing formula, this one does not include weights. Symbolically, it may be written:

$$(1) \quad A_i = \frac{N_i}{\sum_i N_i} \cdot F$$

Where A_i is the amount of aid received by state i; N_i is the number of eligible children in that state, and F is the total appropriation under the program. The results, given in gross terms in Column 1, Table 4 and represented in net terms in Column 2 and graphically in the second part of Figure 1, reveal an interesting contrast. Elimination of the weighting procedure clearly accentuates the pattern of net transfers. New York and California stand to lose much while several of the southern states register gains. More generally net flows increase and the degree of redistribution is considerably higher. A comparison of patterns thus suggests that the weighting procedure can be best understood as a political compromise which the fiscally stronger states (those which also have high average expenditure per pupil) were able to impose on the weaker ones.

To complete the analysis of alternatives, we introduce two formulas which incorporate fiscal capacity as a criterion of distribution. Taking income as the measure of fiscal capacity, we first assume that the fund is allocated among states in proportion to the ratio of need to capacity. In this case:

$$(2) \quad A_i = \frac{N_i / Y_i}{\sum \left(N_i / Y_i \right)} \cdot F$$

Table 4

Alternative Distribution Formulae, ESEA
Gross and Net Payments
(Thousands of Dollars)

50 States and D.C.	Formula 1		Formula 2		Formula 3	
	Gross	Net	Gross	Net	Gross	Net
Alabama	50096	37851	60512	48267	66990	54745
Alaska	1180	150	11306	10275	9740	8709
Arizona	9183	1744	18645	11206	14654	7215
Arkansas	30604	24424	68981	62800	63162	56982
California	63760	-58687	8143	-114304	6863	-115584
Colorado	8449	-2538	12091	1104	10340	-647
Connecticut	5851	-17151	4646	-18356	5640	-17363
Delaware	1533	-3960	6634	1141	7769	2276
Florida	29442	-1112	16517	-14038	17299	-13256
Georgia	49532	33167	42951	26586	45187	28822
Hawaii	2322	-1226	9276	5728	10890	7342
Idaho	3028	-404	14701	11269	15679	12247
Illinois	47513	-30189	10608	-67095	13326	-64377
Indiana	16505	-10503	9509	-17499	9195	-17812
Iowa	16743	2096	17729	3082	16362	1715
Kansas	9442	-2116	12731	1173	10596	-963
Kentucky	39982	27508	48348	35874	59770	47296
Louisiana	41578	26587	46059	31068	38061	23070
Maine	4365	-556	14819	9898	15555	10634
Maryland	13042	-8130	9556	-11615	10099	-11072
Massachusetts	13196	-24798	5941	-32053	8493	-29500
Michigan	30105	-21391	9821	-41674	9210	-42286
Minnesota	18360	-1209	15058	-4511	12422	-7148
Mississippi	52654	46589	111615	105550	103214	97149
Missouri	28187	1066	17386	-9735	21724	-5397
Montana	3220	-785	13618	9613	11274	7268
Nebraska	7248	-648	14493	6597	15856	7960
Nevada	808	-1594	4360	1958	4536	2134

Table 4 (Continued)

50 States and D.C.	Formula 1		Formula 2		Formula 3	
	Gross	Net	Gross	Net	Gross	Net
New Hampshire	1443	-2448	6688	2797	7529	3638
New Jersey	17628	-29750	6291	-41087	7082	-40296
New Mexico	8649	4071	30139	25562	21380	16803
New York	61950	-87161	7807	-141304	7758	-141352
North Carolina	67466	49500	52334	34368	51785	33819
North Dakota	5189	2443	26991	24245	22584	19839
Ohio	36638	-27447	9708	-54376	10100	-53984
Oklahoma	19819	8604	27311	16096	27792	16577
Oregon	6244	-4856	9103	-1998	7699	-3401
Pennsylvania	48677	-27653	11670	-64661	14465	-61865
Rhode Island	3324	-2284	10485	4878	12036	6429
South Carolina	42684	34672	72652	64640	74582	66571
South Dakota	6660	3798	31307	28446	27376	24514
Tennessee	45454	30807	46385	31738	51107	36460
Texas	82259	30534	26076	-25649	25266	-26459
Utah	2848	-1729	9110	4533	6729	2152
Vermont	1609	-452	13198	11137	14507	12446
Virginia	35315	15402	26420	6507	29179	9266
Washington	8869	-9440	7772	-10537	6469	-11841
West Virginia	21997	13873	44233	36109	47175	39051
Wisconsin	14230	-10029	9854	-14405	9730	-14529
Wyoming	1254	-807	10259	8199	7864	5804
District of Columbia	4287	-3838	10582	2457	18334	10209

where Y_i is the income of state i.[14] A checking of the figures in Columns three and four of Table 4, where results for the new formula are given, against those in the previous table confirm the expectation that the introduction of fiscal ability has strong implications for redistribution. The graphic representation of the new pattern in the bottom part of Figure 1 makes this even more apparent. Net contributions are much larger and net drawings have increased correspondingly. Among losers, New York and California are again affected most dramatically - New York's net loss jumps to $144 million - but other industrial states such as Illinois, Pennsylvania and Ohio also feel a strong impact. Among gainers, Mississippi's share more than doubles - a striking improvement in the position of the poorest state. It is interesting to note that some states have the sign of their net transfer changed under the new formulation. The most significant change occurs for Texas where a switch from a $26.6 million receipt to a withdrawal of $25.6 million occurs. This happens because Texas has the largest number of children eligible for assistance but is much lower down on the list of needy states when fiscal capacity is taken into account - it places 16th from the top when states are ranked according to the ratio of need to fiscal capacity.

The last alternative examined introduces a weighting factor to take account of individual states' willingness to tax themselves for

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[14]Personal income figures for 1963 are from U.S., Bureau of the Census, Statistical Abstract of the United States, 1965, (Washington; Government Printing Office, 1965). Table 458, p. 334.

education (tax effort). Although there are a number of different ways of introducing this consideration, we have selected one that relates the tax effort of a state to the average effort of all state governments. The new formula is:

$$(3) \quad A_i = \frac{\frac{N_i}{Y_i\left(\bar{t} / t_i\right)}}{\sum \frac{N_i}{Y_i\left(\bar{t} / t_i\right)}}$$

where t_i is the tax rate of state i for educational expenditure and $\bar{t}$ is the average tax rate for all states combined.[15] The results for the new formula are given in Column 5 of Table 4; they differ very little from those obtained from the preceding formula. A slight effect can be expected if t_i is distributed very closely around $\bar{t}$. In this case, an effort provision seems unnecessary since there is little difference in relative tax effort among states and not much to be rewarded. The slight modification which the addition of tax effort produces in Formula (2) suggests that it may not be wise to complicate our consideration of changes in vertical equity by discussing it further.

2. Gross Aid

While from a theoretical point of view, it is best to measure the redistributive impact of a grant program by analyzing net transfers among states, the policy maker may be more interested in the patterns of gross aid created by alternative formulas. State officials, for example, will

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[15]The tax rate, t_i, is computed by dividing the state's expenditures for education by the state's personal income.

not be concerned with federal taxes raised in their states; they will be interested only in grant payments when comparing the position of their state to that of others. Members of Congress, similarly, may focus on gross aid when evaluating the advantages which a given program offers to their state or district.[16]

Tables 3 and 4 include the statistical material necessary for a separate evaluation of the gross aid pattern. Outpayments are presented along with net aid for both the actual formula and the proposed alternatives. Because the pattern of gross aid is important in policy making, it will be useful to add a brief discussion of gross distribution under the ESEA.

As pointed out, the ESEA has as its purpose to provide federal funds for the education of the disadvantaged. In evaluating gross distribution, we therefore compare the proportion of eligible children in a given state with the proportion of aid which this state receives from the Federal Government. Figure 2 is based on such an analysis. On the vertical axis we measure gross aid to each state as a percentage of all aid and on the horizontal axis we plot percentage figures of eligible children. States are again ranked from low to high according to the ratio of income to need.

Using the modified type of Lorenz curves shown in Figure 2, we can summarize the implications of gross aid patterns. We find that, on

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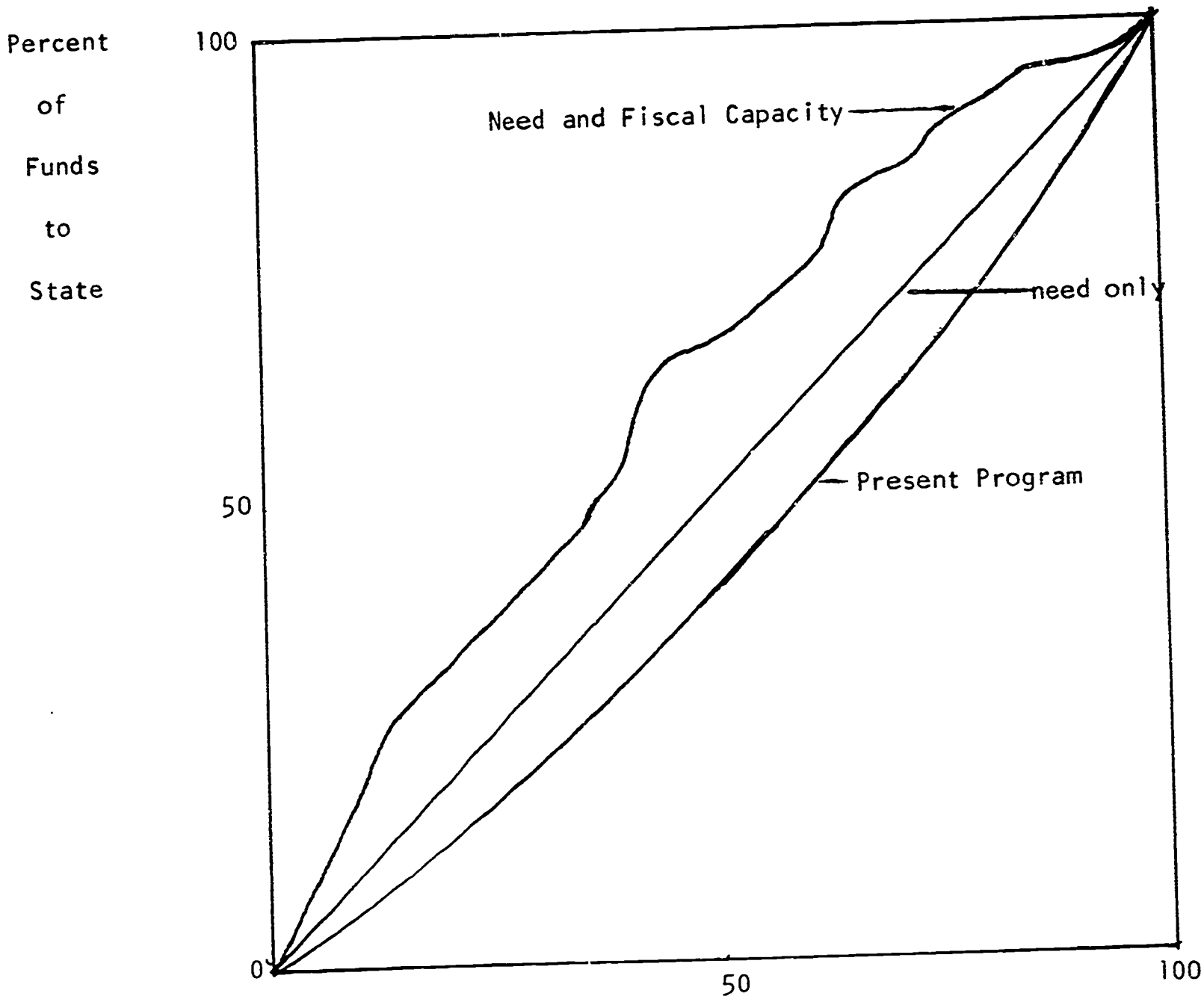
[16]This would seem likely if no rise in taxes accompanies the enactment of the grant program. Given the operation of the progressive income tax, leading to a steadily increasing federal share of GNP, further programs will likely be financed from general revenue sources.

Figure 2

Distribution of Gross Aid Among States



Source: See text.

balance, the distributional impact of the present program is regressive; that is, when measured against the numbers of children eligible for assistance, proportionately more money goes to the richer states than to the poorer ones.[17] In contrast to the curve below the 45° line of equality which represents the actual situation, the curve above the diagonal depicts the distributional impact of gross aid if the alternative formula employing an index of both fiscal capacity and need is used. In this case the children from low income families living in the poorest states receive a proportionally greater share of the total appropriation. Our first alternative, based solely on the numbers of eligible children, coincides exactly with the diagonal since it is based on the premise that assistance would be available in direct proportion to the relative numbers of eligible children in each state. It may be called the "neutral" case when contrasted with the actual formula which has a regressive impact.

Conclusion

In this article we have analysed interstate redistribution under Title One of the Elementary and Secondary Education Act. First, we discussed the horizontal consistency of criteria of distribution. It was found that the present need index provides a satisfactory measure of the disadvantaged school population. An alternative way of measuring the number of children from poverty families - the Orshansky index - yields

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[17]The curves look very similar for an analysis which ranks states by per capita income rather than by the ratio of Y/N. Figure 2 can therefore be interpreted as well in terms of this more common ranking.

results which are closely similar to those based on the official index. It must be noted, however, that recent changes in the Aid to Dependent Children legislation may impair the future usefulness of the official measure.

The second part of our analysis - the part which relates to vertical equity - has implications of a stronger nature. Consideration of both net transfers and gross aid leads us to the conclusion that the degree of redistribution under the present program is very small. It is also clear that the weighting procedure now in use serves to further limit the redistributive impact of a program which might otherwise be considered as merely neutral. Thus the first major act of federal aid to education is a conservative measure when judged by distributional standards. While the fact that such an act was passed by Congress may constitute a new departure, the program itself breaks little new ground in equalizing the states' ability to provide education. If future federal aid legislation is to make a marked contribution to this consideration should be given to introducing fiscal capacity as a criterion for distributing federal funds.